

November
2022

समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO
Technologies, Defence Technologies, Defence Policies,
International Relations and Science & Technology

खंड : 47 अंक : 208

03 नवंबर 2022

Vol.: 47 Issue: 208

03 November 2022



रक्षा विज्ञान पुस्तकालय

Defence Science Library

रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र

Defence Scientific Information & Documentation Centre

मेटकॉफ हाउस, दिल्ली - 110 054

Metcalfe House, Delhi - 110 054

CONTENTS

S. No.	TITLE	Page No.
	DRDO News	1-6
	DRDO Technology News	1-5
1.	डीआरडीओ ने ओडिशा तट पर बैलिस्टिक मिसाइल डिफेंस इंटरसेप्टर के फेज़- II का पहला सफल उड़ान परीक्षण किया	<i>पत्र सूचना कार्यालय</i> 1
2.	DRDO Conducts Successful Maiden Flight-Test of Phase-II Ballistic Missile Defence Interceptor off Odisha Coast	<i>Press Information Bureau</i> 2
3.	India Successfully Tests Ballistic Missile Defence Interceptor Capable of Neutralising Long-range Adversary Missiles	<i>The Indian Express</i> 3
4.	भारत को मिला रक्षा कवच, DRDO ने टेस्ट की एडी-1 मिसाइल; रक्षा मंत्री ने की तारीफ	<i>हिंदुस्तान</i> 4
5.	Very Few Nations have it, Says Rajnath Singh on DRDO's Missile Defence Test	<i>Hindustan Times</i> 5
	DRDO on Twitter	6-6
	Defence News	7-17
	Defence Strategic: National/International	7-17
6.	Raksha Mantri Interaction during Naval Commanders' Conference	<i>Press Information Bureau</i> 7
7.	एल ए सी पर दो हफ्ते के भीतर तैनात होगी प्रचंड की स्क्वार्डन	<i>नवभारत टाइम्स</i> 8
8.	Rajnath Singh Asks Navy to Focus on Futuristic Capability, Challenges	<i>The Tribune</i> 9
9.	Defence Exports Touch Rs 8,000 crore in H1 as Sector Gains from Make in India	<i>Money Control</i> 9
10.	India Races towards Becoming a Global Aerospace Hub on Strong Indigenisation Push	<i>Financial Express</i> 10
11.	Micro Surveillance Drone, Ajeet Mini Designed to Rapidly Equip Dismounted Troops	<i>Financial Express</i> 12
12.	French Navy Frigate Pays Goodwill Visit to Mumbai, Conducts Drill With Indian Warship	<i>RepublicWorld.com</i> 13
13.	Want to be Partner of Choice for India: US Defence Official	<i>The Economic Times</i> 13
14.	उत्तर कोरिया की 23 मिसाइलों के जवाब में दक्षिण कोरिया ने दार्गी 3 मिसाइल, जवाब में किम जोंग ने एक और दागी, जापान के ऊपर से गुजरी	<i>India TV</i> 14
15.	North Korea Fires 23 Missiles, Prompting Air-Raid Alert in South	<i>The Daily Pioneer</i> 16
16.	Australia Plays Down US B-52 Bomber Plan that Angers China	<i>The Daily Pioneer</i> 17
	Science & Technology News	18-19
17.	As GSLV-Mk3 Goes Commercial, Work on Semi-Cryo Picks Up Pace	<i>Times of India</i> 18
18.	Can Rocket Lab Catch the Rocket with a Helicopter this Time?	<i>The Indian Express</i> 19



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

बुधवार, 02 नवंबर 2022

डीआरडीओ ने ओडिशा तट पर बैलिस्टिक मिसाइल डिफेंस इंटरसेप्टर के फेज़- II का पहला सफल उड़ान परीक्षण किया

रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने दिनांक 02 नवंबर, 2022 को ओडिशा के तट पर एपीजे अब्दुल कलाम द्वीप से लार्ज किल एल्टीट्यूड ब्रैकेट के साथ फेज़- II बैलिस्टिक मिसाइल डिफेंस (बीएमडी) इंटरसेप्टर एडी-1 मिसाइल का पहला सफल उड़ान परीक्षण किया। अलग-अलग स्थानों पर स्थित बीएमडी हथियार प्रणाली के सभी अंगों की भागीदारी के साथ यह उड़ान परीक्षण किया गया था। एडी-1 एक लंबी दूरी की इंटरसेप्टर मिसाइल है जिसे लंबी दूरी की बैलिस्टिक मिसाइलों के साथ-साथ विमानों के लो एक्सो-एटमॉस्फेरिक और एंडो-एटमॉस्फेरिक इंटरसेप्शन दोनों के लिए डिज़ाइन किया गया है। यह दो चरणों वाली सॉलिड मोटर द्वारा संचालित है और मिसाइल का लक्ष्य तक सटीक रूप से मार्गदर्शन करने के लिए स्वदेशी रूप से विकसित उन्नत नियंत्रण प्रणाली, नेविगेशन और गाइडेंस एल्गोरिदम से लैस है।

इस उड़ान-परीक्षण के दौरान सभी उप-प्रणालियों ने अपेक्षाओं के अनुसार प्रदर्शन किया और उनका सत्यापन फ्लाइंग डेटा को कैप्चर करने के लिए तैनात रडार, टेलीमेट्री और इलेक्ट्रो ऑप्टिकल ट्रैकिंग स्टेशनो सहित अनेक रेंज सेंसर द्वारा कैप्चर किए गए डेटा द्वारा किया गया। रक्षा मंत्री श्री राजनाथ सिंह ने एडी-1 के सफल उड़ान परीक्षण से जुड़ी डीआरडीओ तथा अन्य टीमों को बधाई दी। उन्होंने इसे दुनिया के बहुत कम देशों के पास उपलब्ध उन्नत तकनीकों के साथ एक अनूठी तरह का इंटरसेप्टर करार दिया। उन्होंने विश्वास व्यक्त किया कि यह देश की बीएमडी क्षमता को और अधिक मजबूत करेगा।

रक्षा अनुसंधान एवं विकास विभाग के सचिव और डीआरडीओ के अध्यक्ष डॉ. समीर वी. कामत ने इस सफल परीक्षण पर अपनी टीम को बधाई देते हुए कहा कि यह इंटरसेप्टर उपयोगकर्ताओं को बढ़िया

अभियानगत लचीलापन मुहैया कराएगा और अलग-अलग प्रकार के कई लक्ष्यों पर निशाना साधने की क्षमता रखता है ।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1873225>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 02 Nov 2022

DRDO Conducts Successful Maiden Flight-Test of Phase-II Ballistic Missile Defence Interceptor off Odisha Coast

Defence Research & Development Organisation (DRDO) conducted a successful maiden flight-test of Phase-II Ballistic Missile Defence (BMD) interceptor AD-1 missile with large kill altitude bracket from APJ Abdul Kalam Island off the coast of Odisha on November 02, 2022. The flight-test was carried out with participation of all BMD weapon system elements located at different geographical locations. The AD-1 is a long-range interceptor missile designed for both low exo-atmospheric and endo-atmospheric interception of long-range ballistic missiles as well as aircraft. It is propelled by a two-stage solid motor and equipped with indigenously-developed advanced control system, navigation and guidance algorithm to precisely guide the vehicle to the target.

During the flight-test, all the sub-systems performed as per expectations and were validated by the data captured by a number of range sensors including Radar, Telemetry and Electro Optical Tracking stations deployed to capture the flight data. Raksha Mantri Shri Rajnath Singh congratulated DRDO and other teams associated with successful flight trial of AD-1. He termed it as a unique type of interceptor with advanced technologies available with a very few nations in the world. He exuded confidence that it will further strengthen the country's BMD capability to the next level. Secretary, Department of Defence R&D and Chairman, DRDO Dr Samir V Kamat congratulated his team on the successful trial, stating that this interceptor will provide great operational flexibility to the users and having capability to engage many different types of targets.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1873179>

India Successfully Tests Ballistic Missile Defence Interceptor Capable of Neutralising Long-range Adversary Missiles

India conducted the first successful flight test of the Ballistic Missile Defence (BMD) interceptor missile capable of neutralising long-range missiles and aircraft, from the APJ Abdul Kalam Island off the Odisha coast on Wednesday. “The Defence Research and Development Organisation (DRDO) conducted a successful maiden flight-test of phase-II Ballistic Missile Defence (BMD) interceptor AD-1 missile with a large kill altitude bracket from the APJ Abdul Kalam Island off the coast of Odisha on November 2. The flight-test was carried out with participation of all BMD weapon system elements located at different geographical locations,” said the Ministry of Defence in a press statement.

The system, which is capable of striking down incoming adversary missiles and aircraft, has been developed under the Ballistic Missile Defence programme. The AD-1 (Air Defence) is a long-range interceptor missile designed for both low exo-atmospheric and endo-atmospheric interception of long-range ballistic missiles as well as aircraft. The missile is propelled by a two-stage solid motor and equipped with an indigenously developed advanced control system and a navigation and guidance algorithm to precisely guide the vehicle to the targets that move at very high speeds. During the flight-test, all the subsystems performed as per expectations and were validated by the data captured by a number of range sensors including radar, telemetry and electro-optical tracking stations deployed to capture the flight data.

DRDO scientists said the fully functional ballistic missile defence system contained high-power radars and could potentially protect large areas from the adversary missile or other air attacks. Defence Minister Rajnath Singh congratulated the DRDO and other teams associated with the trial of the AD-1. He termed it as a unique type of interceptor with advanced technologies available with only very few nations in the world. He exuded confidence that it will further strengthen the country’s BMD capability to the next level. DRDO chairman Dr Samir V Kamat congratulated his team on the successful trial, stating that the interceptor would provide great operational flexibility and have the capability to engage many different types of targets. The development of anti-ballistic missiles is said to have started by the DRDO around the 2000s in view of the development of ballistic assets by Pakistan and China.

The phase-1 of the programme is said to have been completed towards the end of 2010s and consisted of the advanced air defence systems and air defence systems based on the Prithvi missile. The second phase, according to sources, focuses on the development of anti-ballistic defence systems like the US’s Theatre High-Altitude Area Defence system, which can neutralise intermediate-range ballistic missiles. The AD-II, which is capable of neutralising missiles of even higher ranges, is also said to be under development.

<https://indianexpress.com/article/india/ballistic-missile-test-8245478/>

हिन्दुस्तान

बुधवार, 02 नवंबर 2022

भारत को मिला रक्षा कवच, DRDO ने टेस्ट की एडी-1 मिसाइल; रक्षा मंत्री ने की तारीफ

भारत ने इंटरसेप्ट लॉन्ग रेंज मिसाइल का सफल परीक्षण करके मिसाइल कवच की ओर बड़ा कदम बढ़ा दिया है। यह परीक्षण आसान नहीं था। हालांकि भारत को लॉन्ग रेंज की इस मिसाइल को टेस्ट करने में सफलता हासिल हुई है। पहली बार डीआरडीओ ने इस तरह का टेस्ट किया है। इसका नाम एडी-1 है। रक्षा मंत्री ने कहा कि इस तरह का इंटरसेप्टर बहुत ही कम देशों के पास है। मिसाइल को इस तरह से डिजाइन किया गया है कि यह वायुमंडल की ऊपरी सतह और निचली सतह दोनों ही जगह बलिस्टिक मिसाइल और फाइटर प्लेन को धराशायी कर सके। रक्षा मंत्री ने कहा कि यह बहुत ही अनोखी मिसाइल है। इसमें आधुनिक तकनीक उपलब्ध है जो कि बहुत कम देशों के पास है। जानकारी के मुताबिक वायुमंडल के बाहर वार करने में भी यह मिसाइल सक्षम है। यह बलिस्टिक मिसाइल के सामने बहुस्तरीय सुरक्षा प्रदान करेगी।

ओडिशा में एपीजे अब्दुल कलाम द्वीप पर दूसरे चरण के परीक्षण में मिसाइल का सफल टेस्ट हो पाया। मंत्रालय ने अपने बयान में बताया कि कई जगहों पर वेपन सिस्टम लगाकर इस मिसाइल का परीक्षण किया गया था। भारत दो चरणों में बीएमडी प्रोग्राम चला रहा है। पहला चरण पूरा हो गया है और दूसरा जारी है। दूसरे चरण में लॉन्ग रेंज इंटरसेप्ट सिस्टम पर ही काम चल रहा है। एडी-1 मिसाइल दो स्टेज के सॉलिड मोटर से लैस है। इसमें अडवांस कंट्रोल सिस्टम लगाया गया है। इसके अलावा टारगेट करने के लिए नेविगेशन और गाइडेंस बहुत ही उच्च श्रेणी का है। पहले चरण में सब सिस्टम का परीक्षण किय गया था जिससे डेटा कैप्चर, रेंज सेंसर, रडार, टेलीमीट्री और इलेक्ट्रो ऑप्टिकल ट्रैकिंग स्टेशन की जानकारी हासिल हुई। रक्षा मंत्री ने कहा कि यह मिसाइल भारत के रक्षा कवच को और मजबूती देगी। डीआरडीओ के चीफ समीर वी कामत ने कहा कि अलग-अलग टारगेट को हिट करने में यह इंटरसेप्टर बहुत काम आएगा।

<https://www.livehindustan.com/national/story-drdo-tests-ad1-interceptor-missile-rajnath-singh-praises-as-suraksha-kavach-7298683.html>

Very Few Nations have it, Says Rajnath Singh on DRDO's Missile Defence Test

India on Wednesday conducted a critical test to validate and showcase its ballistic missile defence (BMD) capabilities to intercept long-range missiles, the defence ministry said. The Defence Research and Development Organisation (DRDO) successfully tested for the first time a long-range interceptor missile, called AD-1, designed for both low exo-atmospheric and endo-atmospheric interception of ballistic missiles and fighter planes, officials familiar with the matter said. Defence minister Rajnath Singh described the missile as a “unique type of interceptor” equipped with advanced technologies available only with a few countries. India has made significant advances in developing endo-atmospheric and exo-atmospheric intercept systems to destroy incoming hostile missiles within and outside the atmospheric limits, respectively. The two systems have been integrated for a multi-layered defence against ballistic missiles, the officials said.

The phase-II BMD interceptor AD-1 missile with a “large kill altitude bracket” was tested from the APJ Abdul Kalam Island off the Odisha coast. “The flight test was carried out with participation of all BMD weapon system elements located at different geographical locations,” the ministry said in a statement. India is pursuing its BMD programme in two phases – the first phase has been completed while the second is underway, the officials said. The second phase is for validating intercept systems in a new range category, they said.

The AD-1 missile is propelled by a two-stage solid motor and equipped with an indigenously-developed advanced control system, and navigation and guidance algorithm to precisely guide the vehicle to the target, the ministry said. “During the flight test, all the sub-systems performed as per expectations and were validated by the data captured by a number of range sensors including radar, telemetry and electro-optical tracking stations deployed to capture the flight data.” The defence minister said the new missile will further strengthen the country’s BMD capability to the next level, even as DRDO chief Samir V Kamat said the interceptor will provide immense operational flexibility to the users to engage different types of targets. The integrated exo and endo-atmospheric systems offer a hit-to-kill probability of 99.8 per cent, as previously reported.

<https://www.hindustantimes.com/india-news/india-tests-long-range-interceptor-missile-101667416167346.html>

DRDO on Twitter



DRDO ✓
@DRDO_India



[#DRDOUpdates](#) | DRDO
conducts successful maiden
flight-test of Phase-II Ballistic
Missile Defence interceptor off
Odisha coast

[@PMOIndia](#)

[@DefenceMinIndia](#)

[@SpokespersonMoD](#)

pib.gov.in/PressReleasePa...



6:50 PM · Nov 2, 2022 · Twitter Web App



Press Information Bureau
Government of India

Ministry of Defence

Wed, 02 Nov 2022

Raksha Mantri Interaction during Naval Commanders' Conference

As part of ongoing Naval Commanders' Conference, the Raksha Mantri, Shri Rajnath Singh interacted with the senior hierarchy of the Indian Navy on 02 Nov 22. The RM and other senior dignitaries of MoD also witnessed a technology demonstration put up by Naval Headquarters and Weapons and Electronics Systems Engineering Establishment (WESEE), the R&D arm of the Navy, showcasing ongoing and planned indigenous projects utilising niche technologies in the field of Artificial Intelligence, Tactical Communications, Combat Management Systems, Cyber Security, Periscopes and Combat Platform Integration. This reaffirms Indian Navy's commitment of spearheading indigenous efforts in all spheres of Naval Operations.

Hon'ble RM, during the interaction, commended the Navy for maintaining a high Operational tempo towards ensuring secure seas for national security and prosperity. He congratulated the Navy for successful commissioning of INS Vikrant, India's first indigenously designed and constructed Aircraft Carrier and adoption of a new Naval Ensign, shedding vestigial linkages to our colonial past. He appreciated the Navy for evolving into a 'Combat-ready, Credible, Cohesive and Future Proof' force of the country. He also emphasized the importance of 'Whole of Nation' approach towards overcoming the nation's security challenges. The Hon'ble RM appreciated the Navy for the efforts towards indigenisation and innovation in the recent years, while urging the Naval Commanders to maintain focus on futuristic capability development for effectively overcoming emerging challenge in the Maritime Domain.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1873220>

एलएसी पर दो हफ्ते के भीतर तैनात होगी प्रचंड की स्वर्चॉइन रक्षा मंत्री राजनाथ सिंह जा सकते हैं स्वर्चॉइन तैनाती के समारोह में

■ नई दिल्ली : दो हफ्ते के भीतर आर्मी अरुणाचल प्रदेश में वास्तविक नियंत्रण रेखा (एलएसी) के पास लाइट कॉम्बेट हेलिकॉप्टर प्रचंड की पहली स्वर्चॉइन तैनात कर देगी। इस स्वर्चॉइन का बेस मीसामारी में होगा। एलएसी पर चीन के साथ चल रहे गतिरोध के लिहाज से यह बेहद अहम माना जा रहा है। सूत्रों के मुताबिक 15 नवंबर के आसपास स्वर्चॉइन तैनात हो सकती है और रक्षा मंत्री राजनाथ सिंह इससे जुड़े समारोह का हिस्सा हो सकते हैं।

पिछले साल ही मीसामारी में नई आर्मी एविेशन ब्रिगेड भी बनाई गई। एविेशन ब्रिगेड का काम फॉरवर्ड बेस पर सैन्य साजो सामान पहुंचाना, केजुअल्टी इवेक्युएशन और एयर स्पेस की निगरानी करना है। यह चीन के एयरस्पेस पर भी पैनी नजर रखती है। ढाई साल पहले जब ईस्टर्न लद्दाख में एलएसी पर चीन और भारत के बीच गतिरोध हुआ तब से चीन कई बार एलएसी के पास

अपने फाइटर भेज चुका है। साथ ही एलएसी के पास एयरस्पेस का उल्लंघन कर चुका है। ऐसे में एविेशन ब्रिगेड की जिम्मेदारी और भी अहम हो जाती है। मीसामारी ऐसा एविेशन बेस है जहां से ईस्टर्न सेक्टर में एलएसी के हर हिस्से पर किसी भी वक्त जरूरत के हिसाब से बड़े ऑपरेशन लॉन्च किए जा सकते हैं।

लाइन कॉम्बेट हेलिकॉप्टर प्रचंड पहला स्वदेशी अटैक हेलिकॉप्टर है। यह सेना के लिए पहला डेडिकेटेड अटैक हेलिकॉप्टर है। यह हेलिकॉप्टर में 20 एमएम की गन, 70 एमएम के रॉकेट और एंटी टैंक गाइडेड मिसाइल से लैस होगा। इसमें एयर-टु-एयर मिसाइल भी होगी। भारतीय सेना को अभी 5 लाइट कॉम्बेट हेलिकॉप्टर ही मिल रहे हैं। हालांकि सेना 95 और लाइट कॉम्बेट हेलिकॉप्टर लेने की कोशिश में जुटी है।

वहीं, एयरफोर्स के लिए अभी 10 हेलिकॉप्टर का कॉन्ट्रैक्ट हुआ है लेकिन एयरफोर्स को 65 और हेलिकॉप्टर चाहिए। सूत्रों के मुताबिक ये सब करीब 10-15

साल के भीतर मिल पाएंगे। आर्मी एविेशन की तीन ब्रिगेड हैं- लेह, मीसामारी और जोधपुर में। स्वदेशी लाइट कॉम्बेट हेलिकॉप्टर एचएएल ने डिजाइन और डिवेलप किया है।

The Tribune

Wed, 02 Nov 2022

Rajnath Singh Asks Navy to Focus on Futuristic Capability, Challenges

Defence Minister Rajnath Singh today asked Indian Navy Commanders to focus on futuristic capability development for overcoming emerging challenges in the maritime domain. He said this while addressing the naval Commanders' conference here. In his interaction with senior-most Navy Commanders, the minister commended the Navy for maintaining a high operational tempo towards ensuring secure seas for national security and prosperity. He congratulated the Navy for successful commissioning of INS Vikrant, India's first indigenously designed and constructed aircraft carrier.

Singh appreciated the Navy for evolving into a "combat-ready, credible, cohesive and future-proof" force of the country. The minister and senior dignitaries of the Ministry of Defence witnessed a technology demonstration put up by Naval Headquarters and Weapons and Electronics Systems Engineering Establishment (WESEE), the R&D arm of the Navy. It showcased the ongoing and planned indigenous projects utilising niche technologies in the field of artificial intelligence, tactical communications, combat management systems, cyber security, periscopes and combat platform integration.

<https://www.tribuneindia.com/news/nation/rajnath-asks-navy-to-focus-on-futuristic-capability-challenges-446986>



Wed, 02 Nov 2022

Defence Exports Touch Rs 8,000 crore in H1 as Sector Gains from Make in India

Rohit Bedi, co-founder of AROO, India's first defence start-up that produces specialised defence clothing, swears by the government's Make-in-India programme. "Our vision began with the Indian government's focus to promote the indigenisation of key imported products to decrease dependencies on imports," he says. The company's first product was the Extreme Cold Weather Clothing System (ECWCS), which passed its field test in 2017 and is currently manufactured by its Bengaluru-based original equipment manufacturer (OEM). ECWCS is a 3-layer modular clothing system worn together, designed to operate in temperatures of up to -50 degrees Celsius. It is being used by Indian soldiers in high-altitude regions, including the Siachen Glacier

This clothing system has been imported for over 25 years. We can with pride say that AROO ECWCS outperforms the imported clothing systems provided to the Indian Army," claims Bedi. But clothing is just one item in a long list of defence products manufactured indigenously, and

with time, finding buyers outside the country. More than 200 companies have been licensed to produce military equipment and participate in government tenders, preferably on their own, but also in collaboration with foreign companies, if needed. In the defence sector, foreign direct investment (FDI) under the automatic route has been allowed up to 74 percent and up to 100 percent through the government route, wherever it may result in access to modern technology. Since the notification, the total FDI inflow reported till May 2022 is valued at a modest Rs 494 crore.

Speaking to Moneycontrol, Lt Gen Vinod Bhatia (Retd), India's former director general of military operations (DGMO), said: "Indigenous defence production is a very positive step. If you aspire to be an important power, and talk of strategic autonomy, you need to produce your own military hardware. India is the only country in the world that imports arms and ammunition from all over: from Russia, the US, France, Israel, you name it. Indigenous defence production is long overdue, and it has started now." India registered defence exports worth Rs 8,000 crore in the first six months of the current financial year (FY) and aims to achieve an annual export target of Rs 35,000 crore by 2025, say government officials. Last month, Defence minister Rajnath Singh said that India will target annual defence exports of Rs 35,000 crore by the end of FY 2025. Outgoing defence secretary Ajay Kumar said the country's vision of Amrit Kaal (the next 25 years till India's 100th year of independence) is aimed at making India one of the top five countries globally in defence production.

<https://www.moneycontrol.com/news/business/defence-exports-touch-rs-8000-crore-in-h1-as-sector-gains-from-make-in-india-9437631.html>



Wed, 02 Nov 2022

India Races towards Becoming a Global Aerospace Hub on Strong Indigenisation Push

The Indian aerospace sector is abuzz with developments including the Tata-Airbus foundation stone being laid for building the C295 military transport aircraft. Garuda Aerospace has inked a deal with Lockheed Martin to integrate the latter's advanced software with the former's range of drones for commercial and defence purposes. As the largest defence importer, India has now shifted its strategy in the Aerospace & Defence Sector (A&D) towards 'Make-in-India' and further envisioned itself as a global manufacturing hub with 'Make-in-India for the World'. This policy has led to an indigenous aircraft carrier with over 75 percent indigenous content and a light combat aircraft with over 60 percent indigenisation.

Atmanirbharta, AMCA and a missing engine

The indigenisation push is built on a successful strategy of technology transfers and cooperative manufacturing wherein foreign Original Equipment Manufacturer (OEMs) partner with Indian counterparts – public and private, to manufacture in India for Indian defence needs. This caters to existing markets and fosters robust research and development in the country. A stellar example is the Indo-Russian BrahMos supersonic cruise missile. In this bid for indigenisation, a

key component missing from the puzzle has been the engine. Engine manufacturing for modern aircraft has been a secret guarded closer than nuclear technology.

A select few companies enjoy a global presence, with virtually no one else able to manufacture an engine indigenously. Hindustan Aeronautics Limited (HAL) has been unable to produce even a single, low-thrust engine indigenously. Therefore, it sought foreign OEMs to provide an engine for the Light Combat Aircraft (LCA) Tejas. However, “foreign OEMs are replete with international political considerations. Hence, when HAL wanted a GE F414 engine that produced around 100 KN of thrust, it was stuck with a GE F404 engine with only 80 KN of thrust. For the LCA Tejas Mark II, the GE F414 engine will likely be incorporated. However, that will again underpower the Mark II variant, which could have carried more payloads and flown further,” Girish Linganna, Aerospace and Defence Analyst, explains to Financial Express Online.

In the midst of this, the Indian 5th generation aircraft programme, Advanced Medium Combat Aircraft (AMCA), is underway. For the AMCA, UK based Rolls Royce is expected to tie up with the Defence Research and Development Organisation (DRDO) to co-develop engines for this aircraft. “Jet engines contain more than 30,000 moving parts and require the input of various other industries like metallurgy, forging, casting and machining. This complexity poses a bottleneck to anyone aiming to develop an engine single-handedly,” opines Linganna. Engines Made in India. With a push for defence exports and a sufficient domestic interest for state-of-the-art defence equipment, India is now in talks with various engine manufacturers to co-develop an engine for AMCA. The French major, Safran, has already done a similar co-production with HAL for the Shakti helicopter engine. The Shakti engine powers the latest attack helicopter, Light Combat Helicopter (LCH) Prachand.

A similar offer has been put forth by the British engine manufacturer Rolls Royce and the American manufacturer Pratt and Whitney. Even Indian players like Tata plan to work with GE in a joint venture to pitch an engine to HAL. Tata is already developing various engine components for various Leading Edge Aviation Propulsion (LEAP) engines. According to Linganna “AMCA’s engine dilemma has inadvertently converted India into a battleground for engine manufacturers. With a co-development model, manufacturers will earn a piece of the pie out of AMCA and any further developments. HAL also looks to develop the engine for Hindustan Turbo Trainer 40 (HTT 40) indigenously. Annually, HAL plans to develop 170 aircraft, including exports.”

Flyer Friendly Future: The Global Aerospace Forecast

It is estimated that India’s domestic aviation market will contribute over US\$ 30 billion annually to the Gross Domestic Product (GDP). Already the third largest in domestic traffic, it will also be the third largest domestic market. The government is pushing for more aerial connectivity and is expected to build 100 additional airports by 2024 under the UDAN scheme. This means, based on the information available in public domain the number of passengers will go up to over 500 million, with the fleet to be 2500 aircraft strong by 2040s.

Maintenance, Repair and Overhaul (MRO)

As the domestic industry booms, major manufacturers realise India’s geographical and technological potential. Hence, most manufacturers have announced maintenance, repair and overhaul (MRO) facilities for their aircraft to be localised, intending to make India the regional hub. US based Boeing Company launched the Boeing India Repair Development and

Sustainment (BIRDS) programme in 2021 with a vision to make India a regional MRO hub. It has partnered with Indian MSMEs like Air Works and Air India Engineering Services Limited (AIESL) to provide MRO for various Boeing aircraft in service with the Navy and the Air Force.

A major push for the MROs has been the policy rolled out last year by the Ministry of Civil Aviation. The policy included leasing land via open tenders, slashing the royalty charged by the Airports Authority of India (AAI) for MRO and also increasing the period of allotment to 30 years from 3-5 years. The policy aimed at making India a global 'MRO hub'. The increased ease was aimed at curbing the practice of domestic aircraft flying to the Middle East for cheaper MRO.

<https://www.financialexpress.com/defence/india-races-towards-becoming-a-global-aerospace-hub-on-strong-indigenisation-push/2771397/lite/>



Wed, 02 Nov 2022

Micro Surveillance Drone, Ajeet Mini Designed to Rapidly Equip Dismounted Troops

Zuppa Geo Navigation Technologies showcased, an indigenously built, micro surveillance drone Ajeet Mini at the recently concluded DefExpo 2022 at Gandhinagar. 'Made in India', this sub-2kg COTS micro drone, is specifically designed for rapid use by dismounted troops. The first in a series of nano and micro drones to be launched by Zuppa, it is specifically designed and developed with frontline forces across Defence, Paramilitary, Civil Defence and Law Enforcement in mind. The Ajeet Mini, powered by its Aatmanirbhar Autopilot "Nav Gati", along with other cutting edge electronics made by Zuppa, makes it a secure indigenous solution, specially designed for surveillance and monitoring. The company claims that Ajeet Mini ISR is the only drone in the world that is equipped with a specially designed single integrated Day and Night payload that can be switched on the fly.

It's features such as rapid deployment and single Day/Night payload makes Ajeet Mini a significant force multiplier for Defence, Paramilitary, Civil Defense and Law enforcement agencies. Venkatesh Sai, founder of Zuppa, stated that, "Ajeet Mini delivers exactly the same user experience as DJI from the perspective of ease of flying." The vision driving the development of Ajeet Mini was to build a drone similar to DJI in terms of user experience, but equipped with deep security layers to ensure complete data transparency and security against hacking and remote commandeering. With an All Up weight of 1.4 kgs including payload, Ajeet Mini's power to weight ratio ensures that it can also be weaponised with the inclusion of an explosive charge of around 100 gms. A weaponised version of Ajeet Mini can equip the dismounted soldier with a wearable, rugged, immediate and autonomous hovering loitering munition that will be a significant force multiplier for tactical units providing them strike capabilities Beyond Visual Line of Sight (BVLOS).

<https://www.financialexpress.com/defence/micro-surveillance-drone-ajeet-mini-designed-to-rapidly-equip-dismounted-troops/2771376/lite/>

Wed, 02 Nov 2022

French Navy Frigate Pays Goodwill Visit To Mumbai, Conducts Drill With Indian Warship

French Navy Ship Aconit, a La Fayette Class frigate, was on a goodwill visit to Mumbai from October 28 to November 2, and it participated in a military drill with an Indian warship, the defence ministry said on Wednesday. The ship is under the command of Cdr Jean-Bertrand Guyon and is one of the five La Fayette Class frigates of the French Navy. The frigate had earlier visited Visakhapatnam in 2015. Its Commanding Officer, Cdr Guyon, called on Vice Admiral Krishna Swaminathan, Chief of Staff, Western Naval Command, and interacted with him over issues of mutual interest. "During the stay at Mumbai, the ship's crew had professional and social interactions with personnel of the Indian Navy. The visit culminated with an exercise at sea with a warship of the Indian Navy's Western Fleet," it said.

Over the decades, cooperation between India and France has grown exponentially in various defence-related fields. "The current visit of FNS Aconit to Mumbai is a reflection of the growing cooperation between the two navies and their enhanced interoperability. With peace and stability in the region being of common interest, the two navies are committed to working together towards that goal," the ministry said. French frigate Chevalier Paul was also in Mumbai in November last year.

<https://www.republicworld.com/india-news/general-news/french-navy-frigate-pays-goodwill-visit-to-mumbai-conducts-drill-with-indian-warship-articleshow.html>

THE ECONOMIC TIMES

Thu, 03 Nov 2022

Want to be Partner of Choice for India: US Defence Official

The US wants to be the partner of choice for **India** as it diversifies its base for weapon supplies away from Russia and looks at co-developing and co-producing next generation weapon systems, a senior US defence official has said. Rear Admiral Michael L Baker, US defence attaché to India, said that talks are underway to identify areas for sharing of high-end technology and pitched the US as the most qualified partner for development of futuristic weapons. "There are a lot of areas we are working on in order to find a real sweet spot for sharing technology and co-producing and co-developing (defence) articles. There are some pretty tough challenges when it comes to high-end technology and developing next generation equipment and the US is the best partner for that," Admiral Baker said.

While Admiral Baker did not disclose details of the discussions, the US has recently renewed efforts to partner with India for the development of a new fighter jet engine that is required to power newer combat aircraft. India has been looking for a foreign technology collaborator to

develop a jet engine that generates over 110 kilonewton power for its next generation advanced medium combat aircraft (AMCA). Earlier talks with the US under the Defence Technology and Trade Initiative (DTTI) for sharing of jet engine technology had hit a dead end over the quantum of tech transfer required by the Indian side. There are indications that the US may reverse its position and could once again enter the fray. A senior General Electric (GE) executive told ET that active discussions are underway for sharing of technology and there has been “positive movement” in recent days. The company, which supplies the GE 404 engines for India’s home-developed Light Combat Aircraft (LCA), is in talks to upgrade its GE 414 engine to meet requirements projected for the AMCA.

“We will be a strong candidate for the programme. With the current orders, we will have infrastructure and support systems in India. It’s a natural step to go to the next level and upgrade the 414 to satisfy the (Indian) requirements of thrust,” said Youngje Kim, vice president-sales for Asia at GE’s military aviation division. As of now, both Safran from France and Rolls Royce from the UK are in talks with India to co-develop a fighter jet engine in the 110 kilonewton class. A new fighter jet engine complex spearheaded by the Defence Research and Development Organisation (DRDO) is in the works and as per initial assessments, an engine for next generation combat aircraft can be produced within seven years of the project getting sanctioned.

<https://economictimes.indiatimes.com/news/defence/us-remained-watchful-us-official-on-developments-along-indias-border-with-china/articleshow/95260897.cms>



गुरुवार, 03 नवंबर 2022

उत्तर कोरिया की 23 मिसाइलों के जवाब में दक्षिण कोरिया ने दागीं 3 मिसाइल, जवाब में किम जोंग ने एक और दागी, जापान के ऊपर से गुजरी

उत्तर कोरिया की 23 मिसाइलों के जवाब में दक्षिण कोरिया ने दागीं 3 मिसाइल, जवाब में किम जोंग ने एक और दागी, जापान के ऊपर से गुजरी उत्तर कोरिया और दक्षिण कोरिया करीब 70 साल बाद एक दूसरे के आमने-सामने दिखाई दे रहे हैं। उत्तर कोरिया के लगातार होते मिसाइल परीक्षणों को देखते हुए दक्षिण कोरिया ने भी 3 मिसाइल दाग दीं। जिसके जवाब में उत्तर कोरिया ने गुरुवार सुबह यानी आज 1 और मिसाइल दागी, जो जापान के ऊपर से होकर गुजरी है। उत्तर कोरिया ने एक दिन पहले अलग-अलग तरह की मिसाइल दागी थीं, जिनमें बैलिस्टिक मिसाइल भी शामिल हैं। ये मिसाइल दक्षिण कोरिया की समुद्री सीमा के पास उसके जलक्षेत्र के करीब जाकर गिरी। जिसे उसने अस्वीकार्य बताया। उत्तर कोरिया इन मिसाइल परीक्षणों के पीछे का कारण दक्षिण कोरिया और अमेरिका को चेतावनी देना बता रहा है।

ये दोनों ही देश लगातार संयुक्त सैन्य अभ्यास कर रहे हैं, जिससे उत्तर कोरिया काफी आगबबूला हो गया है। वहीं उत्तर कोरिया की तरफ से आज दागी गई मिसाइल की बात करें, तो ये जापान के क्षेत्र के ऊपर से

होकर गुजरी है। जिसके बाद वहां अलर्ट जारी किया गया। जापान सरकार के ब्रोडकास्ट वॉर्निंग सिस्टम के अनुसार, जब जापान के ऊपर से मिसाइल गुजरी तो सेंट्रल जापान में लोगों से इमारत की छत के नीचे शरण लेने को कहा गया। दक्षिण कोरिया की सेना ने भी मिसाइल लॉन्च की सूचना दी, जो उत्तर कोरिया के पूर्वी तट से होकर गुजरी। इसे लंबी दूरी तक मार करने वाली मिसाइल बताया जा रहा है। जब उत्तर कोरिया ने बुधवार को 23 मिसाइल दागीं, तब एक दक्षिण कोरियाई द्वीप पर हवाई हमले के सायरन बजाए गए और लोगों को भूमिगत बंकरों में ले जाया गया। उत्तर कोरिया द्वारा दागी गई मिसाइल में कम से कम एक की दिशा एक दक्षिण कोरियाई द्वीप की ओर थी। हालांकि वह मिसाइल दोनों प्रतिद्वंद्वियों की समुद्री सीमा के पास गिरी।

कीमत चुकाने की दी थी धमकी

दक्षिण कोरिया ने भी जवाबी कार्रवाई के तहत उसी सीमा क्षेत्र में अपनी मिसाइल दागी। इससे कुछ घंटे पहले ही उत्तर कोरिया ने चल रहे दक्षिण कोरियाई-अमेरिकी सैन्य अभ्यास के विरोध में दोनों देशों को धमकी दी थी कि उन्हें 'इतिहास में सबसे भयानक कीमत चुकानी' पड़ सकती है। उत्तर कोरिया ने परमाणु हथियारों का उपयोग करने की भी धमकी दी थी। अमेरिका ने हालांकि कहा है कि उत्तर कोरिया के प्रति उसका कोई शत्रुतापूर्ण इरादा नहीं है और उसने उत्तर कोरिया की परमाणु महत्वाकांक्षाओं को रोकने के लिए अपने सहयोगियों के साथ मिलकर काम करने पर जोर दिया। दक्षिण कोरिया ने कहा है कि उत्तर कोरिया ने अपने पूर्वी और पश्चिमी तटों से कुल 23 मिसाइल दागी हैं।

हवाई हमले का अलर्ट जारी हुआ

दक्षिण कोरिया की सेना ने कहा कि 17 मिसाइल में से एक ने दक्षिण कोरिया के एक द्वीप की दिशा में उड़ान भरी लेकिन वह दोनों प्रतिद्वंद्वियों की समुद्री सीमा के पास गिरी। दक्षिण कोरिया ने कहा कि उसने उस द्वीप के लिए हवाई हमले का अलर्ट जारी किया। इसके कुछ घंटों बाद दक्षिण कोरियाई सेना ने कहा कि उसने द्वीप पर हवाई हमले का अलर्ट वापस ले लिया है। दक्षिण कोरिया के परिवहन मंत्रालय ने कहा कि उसने उत्तर कोरिया द्वारा मिसाइल दागे जाने के मद्देनजर गुरुवार सुबह तक देश के पूर्वी जल क्षेत्र के ऊपर कुछ वायु मार्गों को बंद कर दिया है। 1945 में कोरिया प्रायद्वीप के बंटवारे के बाद से यह पहली बार है, जब कोई बैलिस्टिक मिसाइल दक्षिण कोरिया के जल क्षेत्र के पास गिरी है और उत्तर कोरिया ने एक ही दिन में सबसे ज्यादा मिसाइल दागी हैं। दक्षिण कोरिया ने भी दुर्लभ हवाई हमले की चेतावनी जारी की और जवाब में अपनी मिसाइलें लॉन्च कीं।

<https://www.indiatv.in/world/asia/north-korea-fires-ballistic-missile-flew-over-japan-territory-after-south-korea-launches-2022-11-03-898797>

North Korea Fires 23 Missiles, Prompting Air-Raid Alert in South

Air raid sirens sounded on a South Korean island and residents there evacuated to underground shelters after North Korea fired more than 20 missiles Wednesday, at least one of them in its direction and landing near the rivals' tense sea border. South Korea quickly responded by launching its own missiles in the same border area. The launches came hours after North Korea threatened to use nuclear weapons to get the US and South Korea to “pay the most horrible price in history” in protest of the ongoing South Korean-US military drills that it views as an invasion rehearsal. The White House maintained that the United States has no hostile intent toward North Korea and vowed to work with allies to curb North Korea's nuclear ambitions.

The North's barrage of missile tests also came as world attention was focused on South Korea following a weekend Halloween tragedy that saw more than 150 people killed in a crowd surge in Seoul in what was the country's largest disaster in years. South Korea's military said North Korea launched at least 23 missiles — 17 in the morning and six in the afternoon — off its its eastern and western coasts on Wednesday. It said the weapons were all short-range ballistic missiles or suspected surface-to-air missiles. Also Wednesday, North Korea fired about 100 artillery shells into an eastern maritime buffer zone the Koreas created in 2018 to reduce tensions, according to South Korea's military. The 23 missiles launched is a record number of daily missile tests by North Korea, some experts say.

One of the ballistic missiles was flying toward South Korea's Ulleung island before it eventually landed 167 km (104 miles) northwest of the island. South Korea's military subsequently issued an air raid alert on the island, according to the South's Joint Chiefs of Staff. South Korean media published photos showing island residents moving to underground shelters. Hours later on Wednesday, South Korea's military said it lifted the air raid alert on the island. South Korea's transport ministry said it has closed some air routes above the country's eastern waters until Thursday morning in the wake of the North Korean launches.

That missile landed 26 km (16 miles) away from the rivals' sea border. It landed in international waters but far south of the two countries' border, off the east coast of South Korea. South Korea's military said it was the first time a North Korean missile had landed so close to the sea border since the countries' division in 1948. “This is very unprecedented and we will never tolerate it,” South Korea's Joint Chiefs of Staff said in a statement. In 2010, North Korea shelled a frontline South Korean island off the peninsula's western coast, killing four people. But the weapons used were artillery rockets, not ballistic missiles whose launches or tests are banned by multiple UN Security Council resolutions.

Later Wednesday, South Korean fighter jets launched three air-to-surface, precision-guided missiles near the eastern sea border to show its determination to get tough on North Korean provocations. South Korea's military said the missiles landed in international waters at the same distance of 26 km (16 miles) north of the sea border as the North Korean missile fell earlier

Wednesday. It said it maintains a readiness to win “an overwhelming victory” against North Korea in potential clashes.

<https://www.dailypioneer.com/2022/world/north-korea-fires-23-missiles--prompting-air-raid-alert-in-south.html>



Wed, 03 Nov 2022

Australia Plays Down US B-52 Bomber Plan that Angers China

The Australian defence minister on Wednesday played down the significance of a major upgrade of B-52 facilities planned for northern Australia that has raised China's ire, saying the nuclear-capable US bombers had been visiting since the 1980s. China this week condemned US plans to deploy up to six of the long-range bombers at Royal Australian Air Force Base Tindal in the Northern Territory, arguing the move undermined regional peace and stability. China also warned of a potential arms race in the region. Asked if the upgrade could prove too provocative, Defense Minister Richard Marles told reporters, “I think everyone needs to take a deep breath here.”

The multi-billion-dollar U.S. investment was part of the Enhanced Air Cooperation Program, which has built on a range of air exercises and training activities between the two countries since early 2017. “What we're talking about is a U.S. investment in the infrastructure at Tindal, which will help make that infrastructure more capable for Australia as well,” Marles said. “In terms of U.S. bombers, they've been coming to Australia since the 1980s. They've been training in Australia since 2005. All of this is part of an initiative which was established in 2017,” he added. Australia would be a “significant beneficiary” of the Tindal upgrade, Marles said. Some Australian critics argue the B-52s' increased presence in northern Australia, made possible by the new facilities, would make the country a bigger target in a war between the United States and China.

<https://www.dailypioneer.com/2022/world/australia-plays-down-us-b-52-bomber-plan-that-angers-china.html>

THE TIMES OF INDIA

Tue, 01 Nov 2022

As GSLV-Mk3 Goes Commercial, Work on Semi-Cryo Picks Up Pace

As the GSLV-Mk3 or LVM3 prepares for its second commercial launch, expected in early 2023, Isro's efforts on enhancing its weight-lifting capacity is gaining pace with the space agency expected to complete qualification tests for the semi-cryogenic stage (SC120) in a couple of months. GSLV-Mk3 is India's heaviest rocket yet. Here's some perspective: Between May 26, 1999 (India's first commercial launch) and October 22, 2022, Isro launched 345 foreign satellites, all on PSLV, which together weigh 9,326.4kg. On October 23, 2022, in its first commercial mission, the GSLV-Mk3 put into orbit 5,796kg in a single mission.

Of course, these missions are incomparable given that most of the foreign satellites launched by PSLV were ride-sharing payloads and include tens of small, micro and nano satellites. But there's no doubt that the Mk3 clearly enhances India's prospects. In fact, Isro chairman S Somanath said last week: "The GSLV-Mk3 is India's best commercial bet." At present, the GSLV-Mk3 can carry around four tonnes to a geostationary orbit (GTO) and at least six tonnes to a low earth orbit (LEO). Induction of the high propulsive SC120, along with increased propellant loading of the cryogenic upper stage (CUS) can enhance this to six tonnes (GTO) and 10 tonnes (LEO). Isro spokesperson Sudheer Kumar told TOI: "The GSLV-Mk3 programme was envisaged to eventually carry at least 10 tonnes to LEO and six tonnes to GTO orbits. We'll achieve this with an upgrade of the cryo stage with additional propellant loading and induction of the semi-cryo stage that will replace the L110..."

"...Work on the semi-cryo engine is almost nearing completion. Qualification tests are in progress. Stage and engine development phase is complete and the test stand is getting ready for carrying out tests. At present sub-system level tests are going on at testing facilities in Mahendragiri and LPSC (Liquid propulsion systems centre)," he added. GSLV-Mk3 is a three-stage vehicle with two solid strap-on motors (S200), one liquid core stage (L110) and a high-thrust cryogenic upper stage (C25). While the S200 will remain the same, the SC120 will replace L110 and C25 will be upgraded. "...We are expecting qualification to be completed in a couple of months unless some anomalies are found which may call for repeated tests, which are not unusual during the evolution stage," Kumar said.

He added that aside from increasing the payload carrying capability, the new configuration would also make the vehicle safer as it will use non-toxic elements compared to L110. "It will use refined kerosene, which is like aviation fuel. This means stage handling will be very safe, there will be an increased capacity, ground systems handling becomes much simpler and storage leakages and human aspect concerns get reduced while handling the stage," Kumar said. The GSLV-Mk3 project was first approved in 2002, with a mandate of achieving the capability to

launch a four-tonne class satellite to Geosynchronous orbit (GEO), which Isro achieved through three demonstration missions.

<https://timesofindia.indiatimes.com/city/bengaluru/as-gslv-mk3-goes-commercial-work-on-semi-cryo-picks-up-pace/articleshow/95217817.cms>



Wed, 02 Nov 2022

Can Rocket Lab Catch the Rocket with a Helicopter this Time?

Space rockets are incredibly complex machines that are astronomically expensive to develop, research, test and use. But one way to recover some of the cost is if the rocket is reusable. California-based Rocket Lab has a slightly outlandish idea for a reusable rocket—one that can be caught by a helicopter after launch. The company is going to attempt to do that again on November 4.

Partially Successful first launch attempt

Rocket Lab first attempted to launch a rocket and catch it in May this year. In May, the company's Electron 1 rocket launched 34 satellites toward orbit and its four-storey tall booster stage fell back to Earth with parachutes to brake its speed. As the booster stage fell back to Earth, a helicopter with a long, vertical cable hanging from it moved towards the booster stage. As it dropped at a speed of roughly 35 kilometres per hour, the helicopter's cable latched on the booster's capture line. But the helicopter pilots were forced to release the rocket from the cable soon after it was caught. A Rocket Lab spokesperson later confirmed to Reuters that the pilots had noticed "different load characteristics" than what was experienced during tests.

Next launch and catch attempt

Rocket Labs is targeting a launch between 5.15 PM and 6.30 PM CET (9.45 PM and 11 PM IST) on November 4. On that day, the Electron rocket will launch from Pad B at the Rocket Lab Launch Complex 1 on New Zealand's Mahia Peninsula, for the company's second reusability mission of 2022. Just before the rocket lifts off, a customised Sirosky S-92 recovery helicopter will fly to the capture zone at sea, almost 300 kilometres off the coast of New Zealand. After the launch, the first and second stages will separate. The first stage will fall back to Earth while the second stage will continue to carry the payload into orbit.

Around 7 minutes after lift-off, the booster stage's first parachute will deploy, followed by its main parachute. This will slow down the descent speed of the rocket from 8,300 kilometres per hour to just 36 kilometres per hour. As the rocket enters the capture zone, the recovery helicopter will match the rocket's speed and will attempt to secure the parachute engagement line to the helicopter from above. If the rocket is successfully captured and secured, the helicopter will transport the rocket back to the company's Auckland Production Complex where technicians will assess whether it is suitable for re-use.

<https://indianexpress.com/article/technology/science/rocket-lab-electron-rocket-launch-novemebr-4-8245145/lite/>

